Lab Cycle 5

1.Write a program to implement simple web crawler using Python extract and display the content of the page (p tag)

Input code:

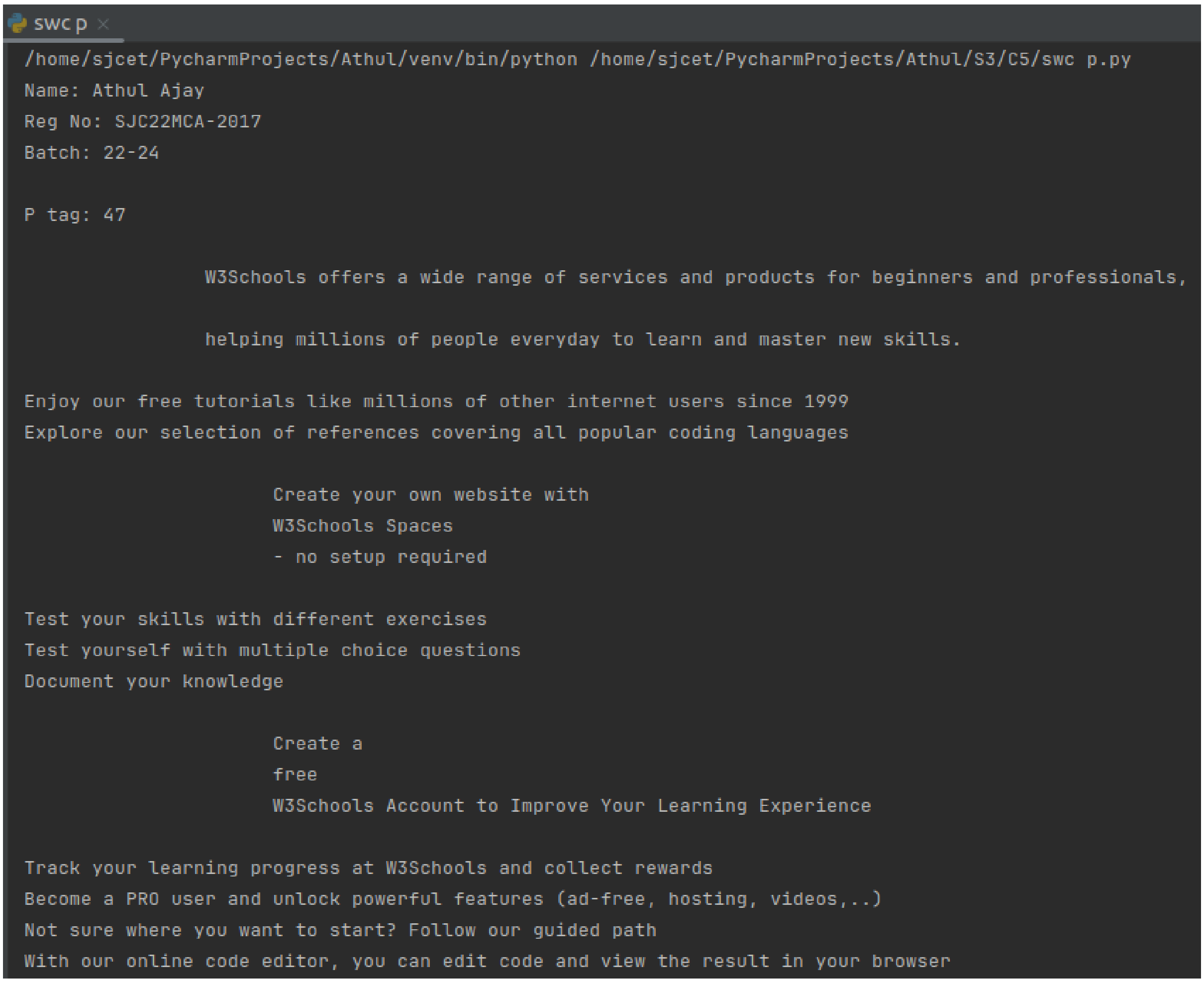
```
import requests
from bs4 import BeautifulSoup

def getdata(url):
    r = requests.get(url)
    return r.content

htmldata = getdata("https://www.w3schools.com/python/python_ml_scale.asp")
soup = BeautifulSoup(htmldata, 'html.parser')
data = ''
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
pr = len(soup.find_all('p'))
print("P tag:", pr)

for data in soup.find_all('p'):
    print(data.get_text())
```

Output:



```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/PycharmProjects/Athul/S3/C5/swc p.py
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

P tag: 47

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```
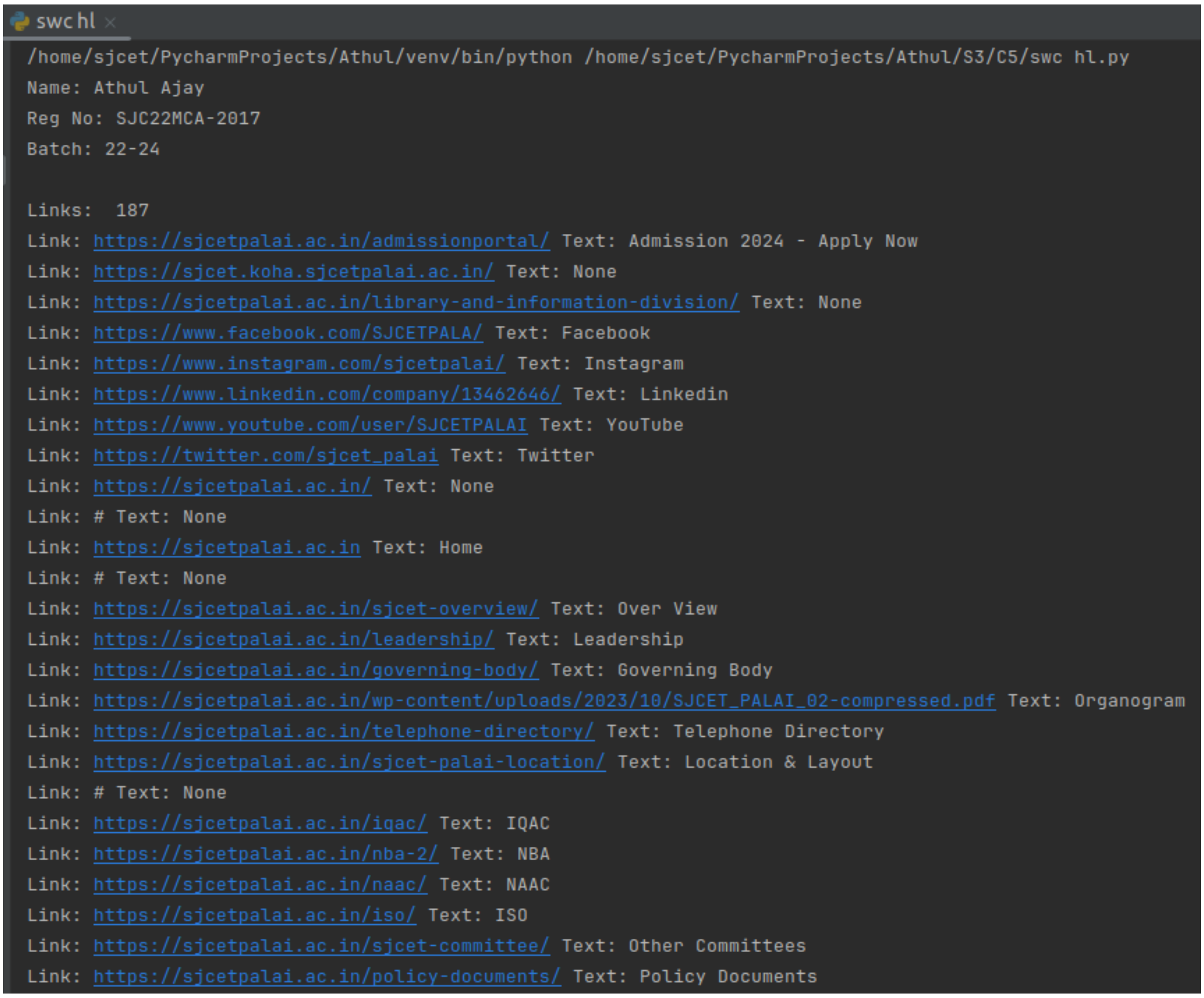

2. Write a program to implement simple web crawler using Python. Display all hyperlinks in the page

Input:

```
import requests
from bs4 import BeautifulSoup

def getdata(url):
    r = requests.get(url)
    return r.content

htmldata = getdata("https://sjcetpalai.ac.in/")
soup = BeautifulSoup(htmldata, 'html.parser')

print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
links = soup.find_all("a")
print("Links: ", len(links))
for link in links:
    if link.get("href") != "":
        print("Link:", link.get("href"), "Text:", link.string
```

Output:



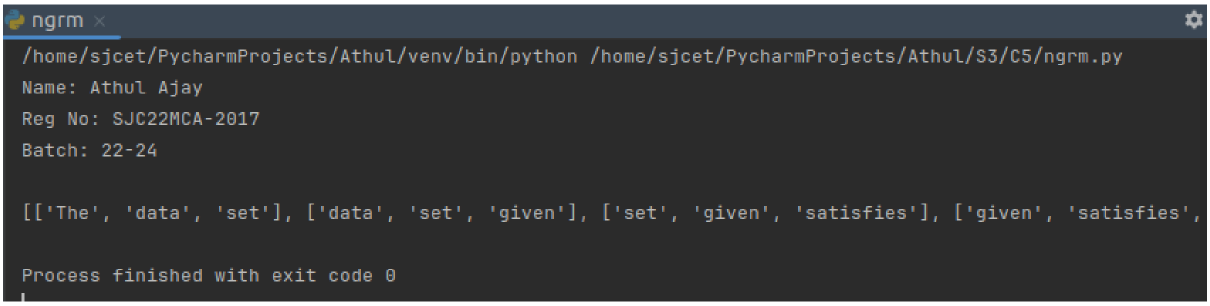
```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/PycharmProjects/Athul/S3/C5/swc hl.py
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Links:  187
Link: https://sjcetpalai.ac.in/admissionportal/ Text: Admission 2024 - Apply Now
Link: https://sjcet.koha.sjcetpalai.ac.in/ Text: None
Link: https://sjcetpalai.ac.in/library-and-information-division/ Text: None
Link: https://www.facebook.com/SJCETPALA/ Text: Facebook
Link: https://www.instagram.com/sjcetpalai/ Text: Instagram
Link: https://www.linkedin.com/company/13462646/ Text: Linkedin
Link: https://www.youtube.com/user/SJCETPALAI Text: YouTube
Link: https://twitter.com/sjcet_palai Text: Twitter
Link: https://sjcetpalai.ac.in/ Text: None
Link: # Text: None
Link: https://sjcetpalai.ac.in Text: Home
Link: # Text: None
Link: https://sjcetpalai.ac.in/sjcet-overview/ Text: Over View
Link: https://sjcetpalai.ac.in/leadership/ Text: Leadership
Link: https://sjcetpalai.ac.in/governing-body/ Text: Governing Body
Link: https://sjcetpalai.ac.in/wp-content/uploads/2023/10/SJCET_PALAI_02-compressed.pdf Text: Organogram
Link: https://sjcetpalai.ac.in/telephone-directory/ Text: Telephone Directory
Link: https://sjcetpalai.ac.in/sjcet-palai-location/ Text: Location & Layout
Link: # Text: None
Link: https://sjcetpalai.ac.in/iqac/ Text: IQAC
Link: https://sjcetpalai.ac.in/nba-2/ Text: NBA
Link: https://sjcetpalai.ac.in/naac/ Text: NAAC
Link: https://sjcetpalai.ac.in/iso/ Text: ISO
Link: https://sjcetpalai.ac.in/sjcet-committee/ Text: Other Committees
Link: https://sjcetpalai.ac.in/policy-documents/ Text: Policy Documents
```

3. Program for Natural Language Processing which performs n-grams (without using library)

Input:

```
def gen_ngrams(text, WordsToCombine):
    words = text.split()
    output = []
    for i in range(len(words) - WordsToCombine + 1):
        output.append(words[i:i + WordsToCombine])
    return output
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
x = gen_ngrams(
    text= 'The data set given satisfies the requirement for model generation and s
used in Data Science Lab',
    WordsToCombine=3)
print(x)
```

Output:



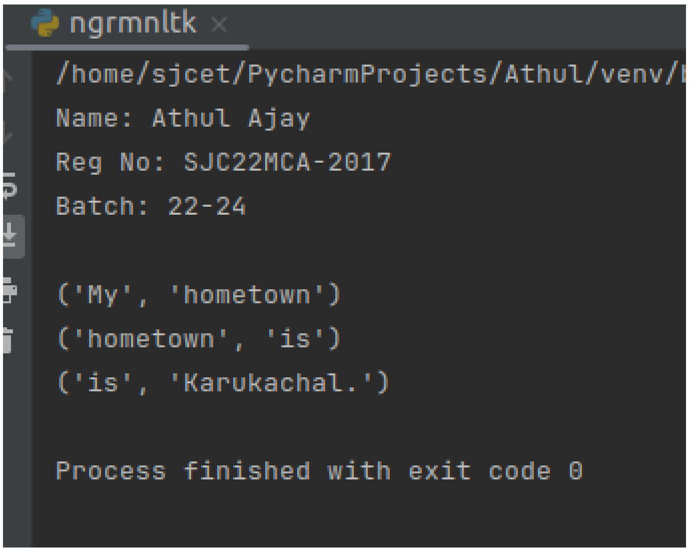
```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/PycharmProjects/Athul/S3/C5/ngrm.py
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

[['The', 'data', 'set'], ['data', 'set', 'given'], ['set', 'given', 'satisfies'], ['given', 'satisfies',

Process finished with exit code 0
```

4. Program for Natural Language Processing which performs n-grams (using nltk library)

Input:

```
print("Name: Athul Ajay")

print("Reg No: SJC22MCA-2017")

print("Batch: 22-24")

print()

from nltk import ngrams

sent = "My hometown is Karukachal."

n = 2

unigrams = ngrams(sent.split(), n)

for grams in unigrams:

    print(grams)
```

Output:



```
/home/sjcet/PycharmProjects/Athul/venv/
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

('My', 'hometown')
('hometown', 'is')
('is', 'Karukachal.')

Process finished with exit code 0
```

5. For given text,

 perform word

 sentence tokenization

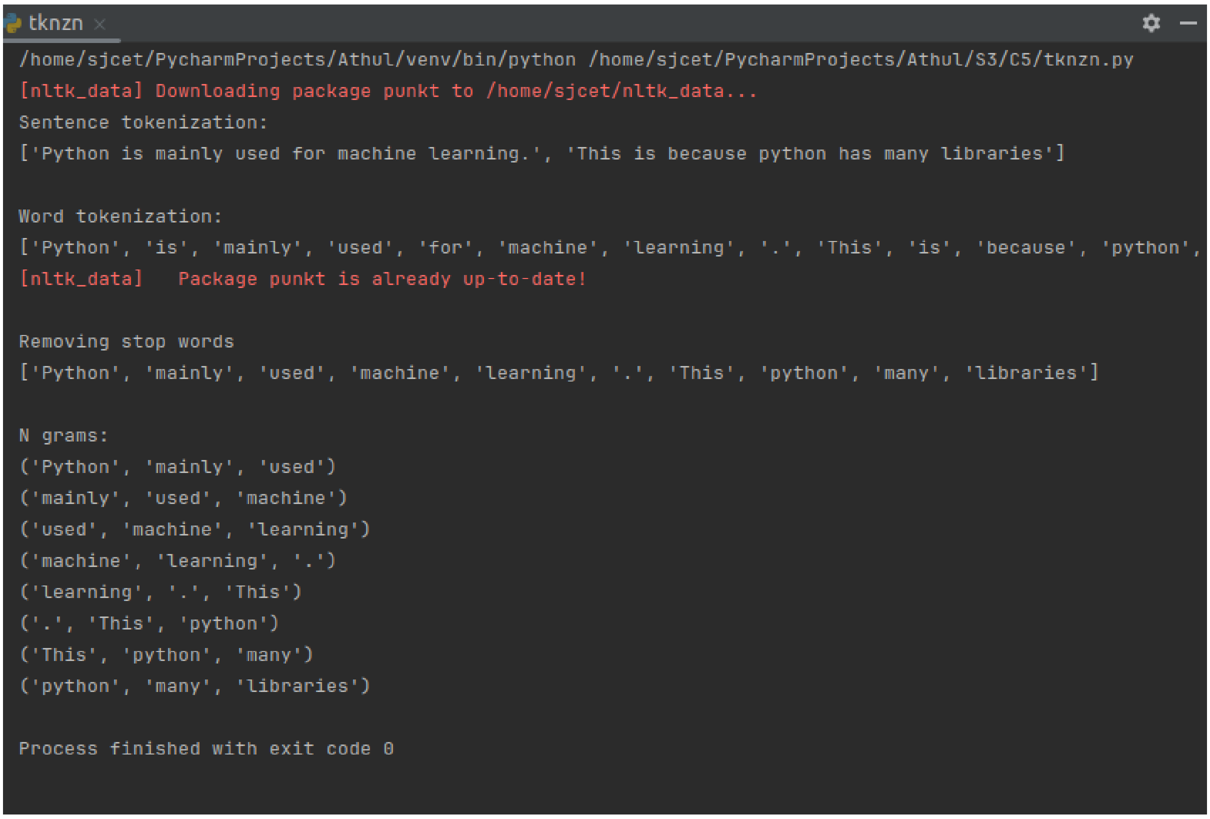
 Remove the stop words from the given text

 create n-grams

Input:

```
import nltk
from nltk import ngrams
from nltk.corpus import stopwords
from nltk.tokenize import sent_tokenize, word_tokenize
nltk.download('punkt')
txt1 = 'Python is mainly used for machine learning. This is because python has many libraries'
print('Sentence tokenization: ')
print(sent_tokenize(txt1))
print()
print('Word tokenization: ')
print(word_tokenize(txt1))
text = word_tokenize(txt1)
txt2 = [word for word in text if word not in stopwords.words('english')]
print()
print('Removing stop words')
print(txt2)
print()
print('N grams: ')
unigrams = ngrams(txt2, 3)
for grams in unigrams:
    print(grams)
```

Output:



```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/PycharmProjects/Athul/S3/C5/tknzn.py
[nltk_data] Downloading package punkt to /home/sjcet/nltk_data...
Sentence tokenization:
['Python is mainly used for machine learning.', 'This is because python has many libraries']

Word tokenization:
['Python', 'is', 'mainly', 'used', 'for', 'machine', 'learning', '.', 'This', 'is', 'because', 'python',
[nltk_data]   Package punkt is already up-to-date!

Removing stop words
['Python', 'mainly', 'used', 'machine', 'learning', '.', 'This', 'python', 'many', 'libraries']

N grams:
('Python', 'mainly', 'used')
('mainly', 'used', 'machine')
('used', 'machine', 'learning')
('machine', 'learning', '.')
('learning', '.', 'This')
('.', 'This', 'python')
('This', 'python', 'many')
('python', 'many', 'libraries')

Process finished with exit code 0
```

6. Given dataset contains 200 records and five columns, two of which describe the customer’s annual income and spending score. The latter is a value from 0 to 100. The higher the number, the more this customer has spent with the company in the past:

Using k means clustering create 6 clusters of customers based on their spending pattern.

□ Visualize the same in a scatter plot with each cluster in a different color scheme.

□ Display the cluster labels of each point (print cluster indexes)

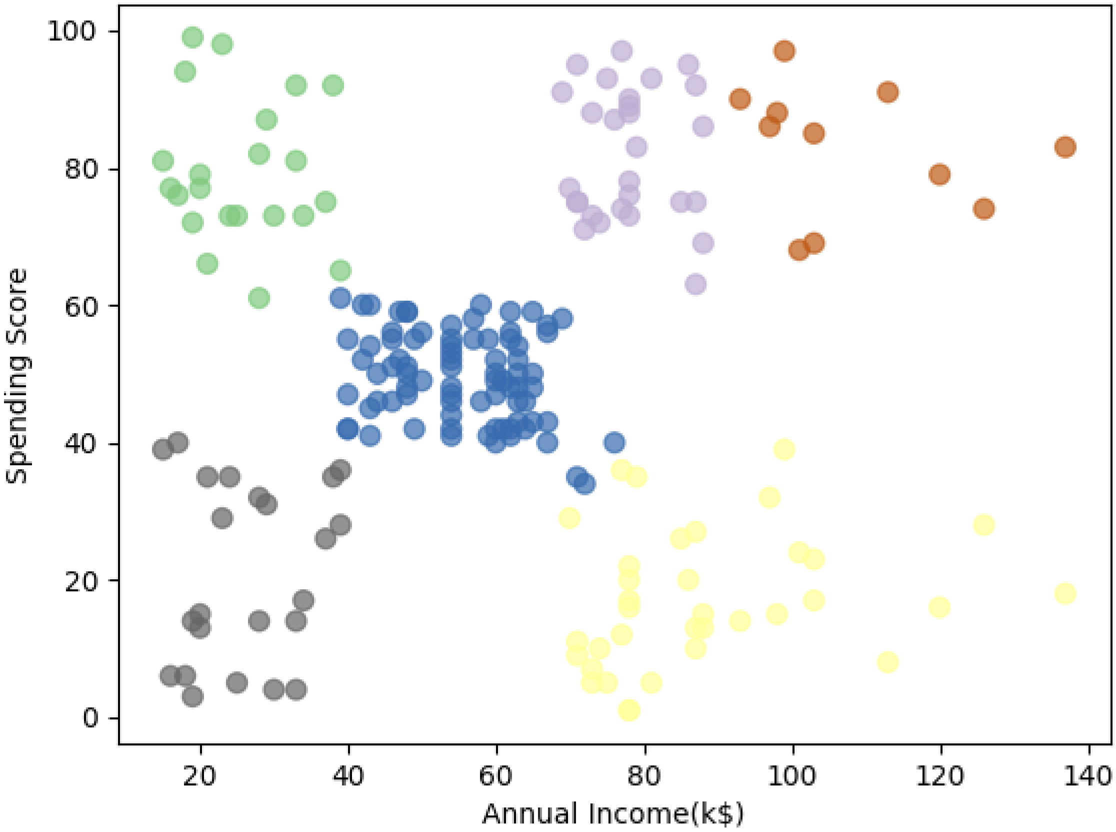
□ Display the cluster centers.

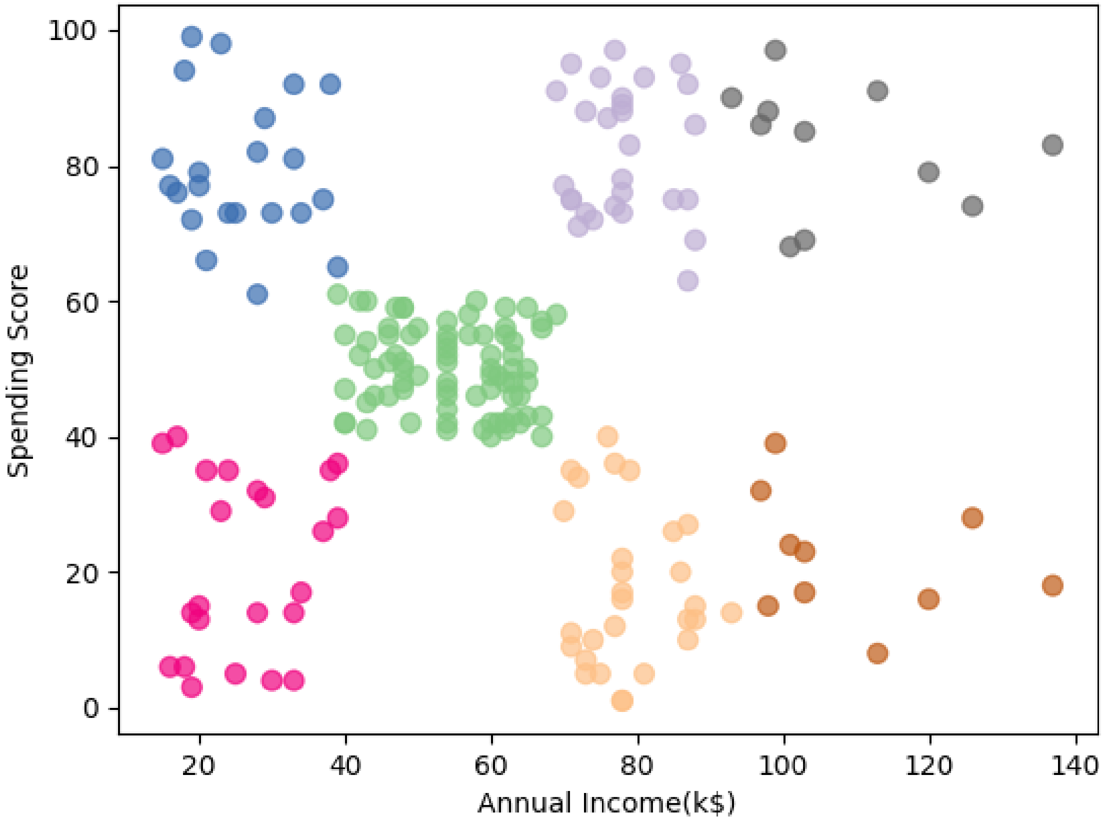
□ Use different values of K and visualize the same using scatter plot

Input:

```
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.cluster import  KMeans
cust = pd.read_csv('customer_data.csv')
cust.head()
point = cust.iloc[:, 3:5].values
x = point[:, 0]
y = point[:, 1]
plt.scatter(x, y, s=50, alpha=0.7)
plt.xlabel('Annual Income(k$)')
plt.ylabel('Spending Score')
plt.show()

kmeans = KMeans(n_clusters=6, random_state=0)
kmeans.fit(point)
pred_clust_index =kmeans.predict(point)
plt.scatter(x, y, c=pred_clust_index, s=50, alpha=0.7, cmap='virdis')
plt.xlabel('Annual Income(k$)')
plt.ylabel('Spending Score')
plt.show()

center = kmeans.cluster_centers_
plt.scatter(center[:, 0], center[:, 1], c='red', s=100)
plt.xlabel('Annual Income(k$)')
plt.ylabel('Spending Score')
plt.show()

#displays 7 diff clusters
kmeans = KMeans(n_clusters=7, random_state=0)
kmeans.fit(point)
pred_clust_index =kmeans.predict(point)
plt.scatter(x, y, c=pred_clust_index, s=50, alpha=0.7, cmap='virdis')
plt.xlabel('Annual Income(k$)')
plt.ylabel('Spending Score')
plt.show()

center = kmeans.cluster_centers_
plt.scatter(center[:, 0], center[:, 1], c='red', s=100)
plt.xlabel('Annual Income(k$)')
plt.ylabel('Spending Score')
plt.show()
```

Output:


100
80
60
40
20
0
Spending Score
20
40
60
80
100
120
140
Annual Income(k$)


100
80
60
40
20
0
Spending Score
20
40
60
80
100
120
140
Annual Income(k$)